

Name: _____

Date: _____

Exam: Function Reflections (EXAM version 621)

1. (worth 9 points) Let function f be defined by the polynomial below:

$$f(x) = 2x^4 + 5x^3 - 9x^2 + 8x - 7$$

Draw lines that match each function reflection with its polynomial:

Reflections

Polynomials

$f(-x)$ •

• $-2x^4 + 5x^3 + 9x^2 + 8x + 7$

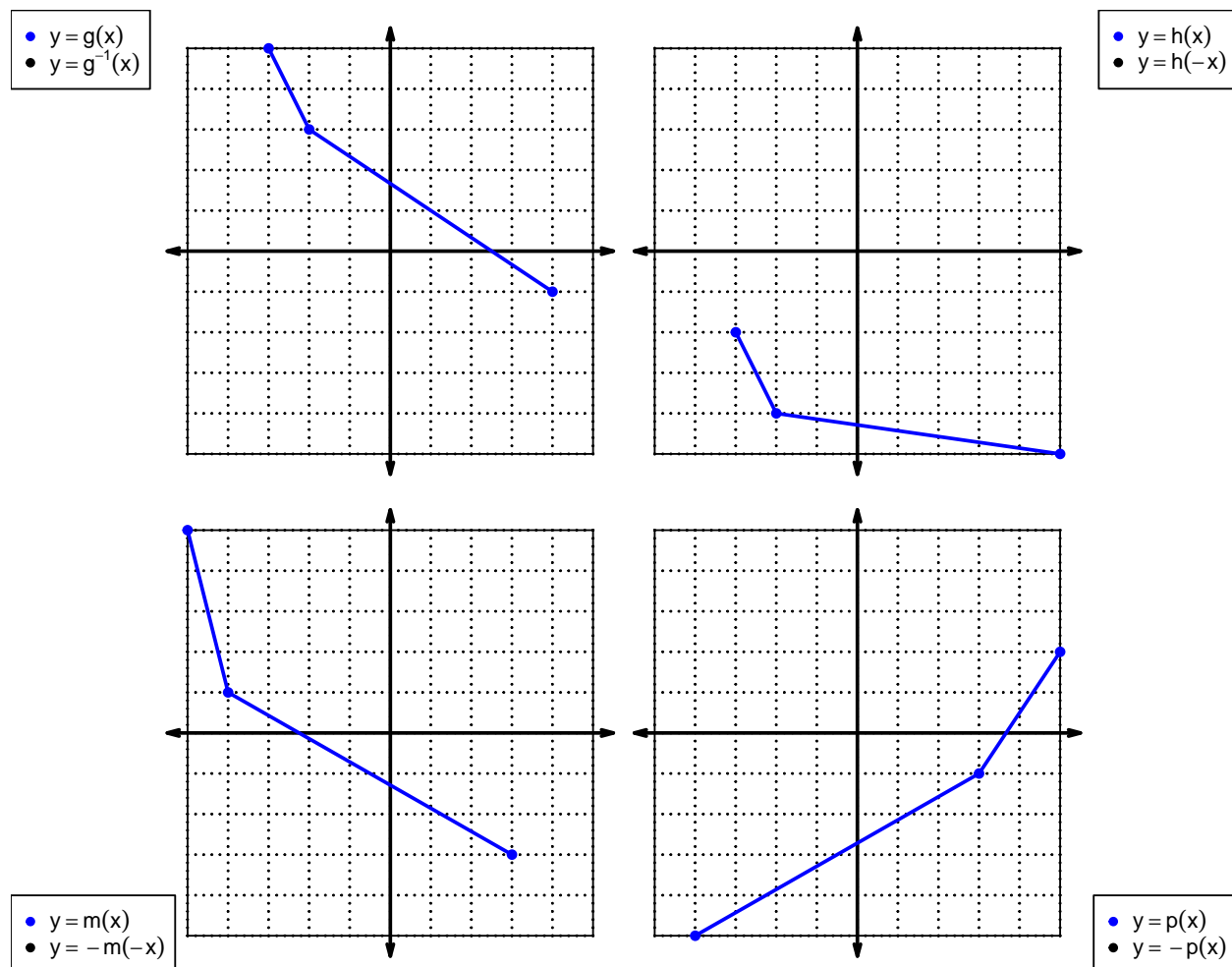
$-f(x)$ •

• $-2x^4 - 5x^3 + 9x^2 - 8x + 7$

$-f(-x)$ •

• $2x^4 - 5x^3 - 9x^2 - 8x - 7$

2. (worth 20 points) In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions f , g , and h are defined by the table below.

| x | $f(x)$ | $g(x)$ | $h(x)$ |
|-----|--------|--------|--------|
| 1 | 8 | 3 | 5 |
| 2 | 4 | 2 | 1 |
| 3 | 9 | 4 | 7 |
| 4 | 1 | 7 | 6 |
| 5 | 3 | 6 | 9 |
| 6 | 5 | 9 | 3 |
| 7 | 6 | 8 | 2 |
| 8 | 2 | 5 | 4 |
| 9 | 7 | 1 | 8 |

3. (worth 3 points) Evaluate $h(5)$.

4. (worth 3 points) Evaluate $g^{-1}(7)$.

5. (worth 3 points) Assuming h is an **odd** function, evaluate $h(-6)$.

6. (worth 3 points) Assuming f is an **even** function, evaluate $f(-1)$.

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7. (worth 15 points) A function, f , is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g , is **odd** if $g(x) = -g(-x)$ for all x in the domain.

Let polynomial p be defined with the following equation:

$$p(x) = x^2 - 1$$

- a. Express $p(-x)$ as a polynomial in standard form.

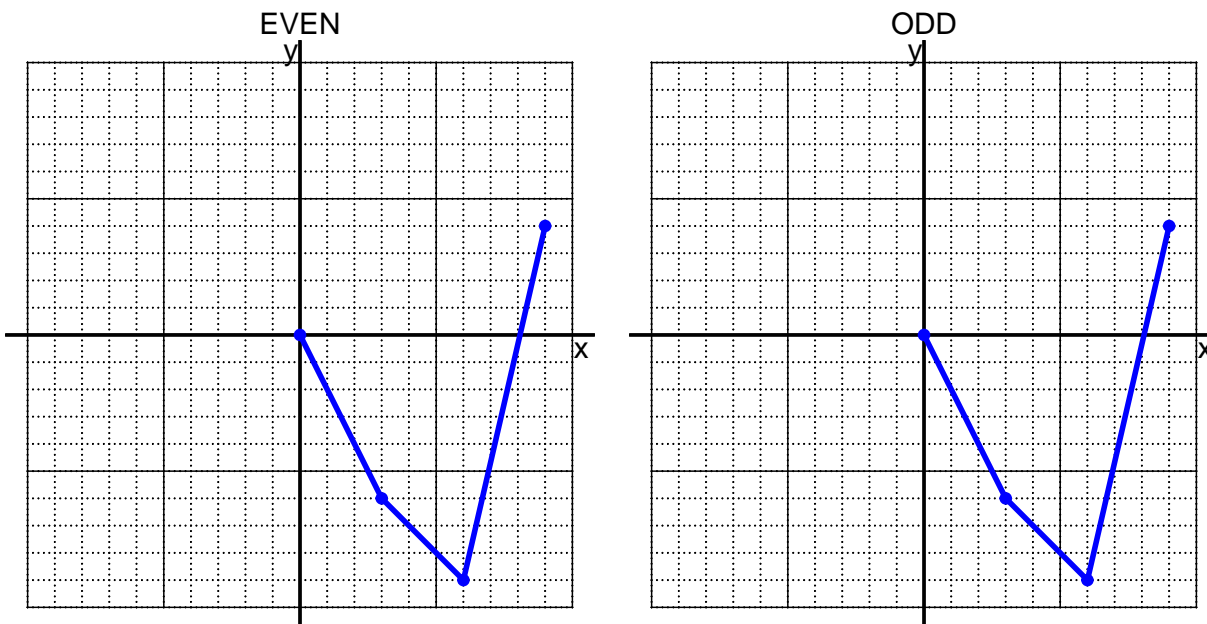
- b. Express $-p(-x)$ as a polynomial in standard form.

- c. Is polynomial p even, odd, or neither?

- d. Explain how you know the answer to part c.

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8. (worth 10 points) I have drawn half of a function. Draw the other half to make it even or odd.



9. (worth 10 points) Let function f be defined with the equation below.

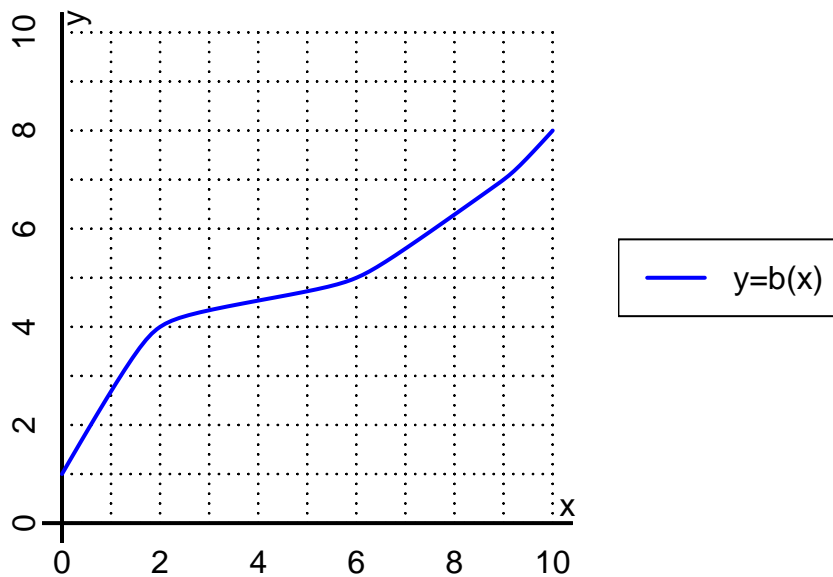
$$f(x) = \frac{x+7}{2}$$

a. Evaluate $f(55)$.

b. Evaluate $f^{-1}(47)$.

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10. (worth 6 points) The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(9)$.

b. Evaluate $b^{-1}(4)$.

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11. (worth 18 points) Function f is defined by the table below.

a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

| x | $f(x)$ | $-f(x)$ | $f(-x)$ | $-f(-x)$ |
|-----|--------|---------|---------|----------|
| -2 | 9 | | | |
| -1 | -4 | | | |
| 0 | 0 | | | |
| 1 | 4 | | | |
| 2 | -9 | | | |

b. Is function f even, odd, or neither?

c. How do you know the answer to part b?